

REMARKS

This Amendment is fully responsive to the non-final Office Action dated May 29, 2008, issued in connection with the above-identified application. Claims 1-4 and 7-9 were previously pending in the present application. With this Amendment, claims 2-4 and 7-20 has been canceled without prejudice or disclaimer to the subject matter therein; and claims 1, 5 and 6 have been amended. Accordingly, claims 1, 5, and 6 are now all the claims pending in the present application. No new matter has been introduced by the amendments made to the claims. Favorable reconsideration is respectfully requested.

To facilitate the Examiner's reconsideration of the present application, the Applicants have provided amendments to the specification and abstract. The changes to the specification and abstract include editorial and clarifying changes. Replacement paragraphs and a replacement abstract are provided showing the changes made to the original specification and abstract. No new matter has been introduced by the changes made to the specification and abstract.

In the Office Action, claims 1-4 and 7-9 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshino et al. (U.S. Patent No. 5,419,948, hereafter "Yoshino") in view of Yasuhara et al. (U.S. Patent No. 6,221,179, hereafter "Yasuhara"). Accordingly, the Applicants have herein amended independent claim 1 to help further distinguish the present invention from the cited prior art. Specifically, claim 1 (as amended) recites the following features:

"[a] screw or a tapping screw made of steel with an ultra fine structure of ferrite grains having a 3 μm or less average grain size and a nitride layer in a surface part, wherein the nitride layer in the surface part has a 100 μm or less thickness, hardness of the nitride layer of the surface part is 560 or more in Vickers hardness, ferrite in the vicinity of the nitride layer has a 1 μm or less average grain size, ferrite of a core part has a 3 μm or less, and hardness of the core part is 199-450 in Vickers hardness."

The features noted above in claim 1 are fully supported by the Applicants' disclosure (see e.g., page 5, lines 2-3; and page 5, line 10-12; page 6; page 6, line 7; and Table 2).

In the Office Action, the Examiner relies on Yoshino in view of Yasuhara for disclosing or suggesting all the features recited in independent claim 1. However, the Applicants assert that the cited prior art fails to disclose or suggest all the features recited in claim 1 (as amended).

Yoshino discloses an austenitic steel stainless steel screw surface that is formed into a hard nitride layer so as to harden and be part of a screw (see e.g., abstract). Additionally, Yasuhara discloses a hot rolled steel sheet with improved formability which can be easily produced with general hot strip mills such that the final ferrite grain diameter is less than 2 μm (see e.g., abstract).

As noted above, Yoshino discloses a screw with a nitride layer and Yasuhara discloses a method of making steel with ferrite grains that are less than 2 μm in diameter. However, a screw or tapping screw having an ultrafine structure of ferrite grains, thickness of nitride layer of a surface part and a hardness balance between the surface part and the core part (as recited in independent claim 1) is not disclosed or suggested by the combination of Yoshino and Yasuhara.

Specifically, the ultrafine structure of ferrite is apt to coarsen by a soft-nitriding process and Yasuhara do not disclose or suggest any deterioration of properties of steel due to increasing of a diameter of ferrite grains. Furthermore, Yasuhara does not disclose or suggest that a nitride layer is formed on the material with ferrite grains that are 2 μm or less. Thus, one of ordinary skill in the art would not be motivated by the teachings of Yoshino and Yasuhara to develop a screw or tapping screw as recited in independent claim 1 (as amended).


Based on the above discussion, no combination of Yoshino and Yasuhara would result in, or otherwise render obvious, the present invention as recited in claim 1 (as amended). Likewise, no combination of Yoshino and Yasuhara would result in, or otherwise render obvious, claims 5 and 6 at least by virtue of their dependency from independent claim 1.

In light of the above, the Applicants respectfully submit that all the pending claims are patentable over the prior art of record. The Applicants respectfully request that the Examiner withdraw the rejection presented in the Office Action dated May 29, 2008, and pass the present application to issue.

The Examiner is invited to contact the undersigned attorney to resolve any remaining issues.

Respectfully submitted,

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